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09/672,182	09/28/2000	Antoine Drouot	PHF 99.584	9178

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P.O. BOX 3001  
BRIARCLIFF MANOR, NY 10510

EXAMINER

HESELTIME, RYAN J

ART UNIT PAPER NUMBER

2623

DATE MAILED: 08/15/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/672,182

Applicant(s)

DROUOT, ANTOINE

Examiner

Ryan J Hesseltine

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Drawings*

2. The drawings are objected to because it appears that the vertical edge detection matrix (Sv) in the upper right of figure 4 is incorrect in that the upper right element (first row, third column) is negative one (-1) and should be a one (1). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Objections*

3. Claim 1 is objected to because of the following informalities: the claim language is generally unclear and indefinite. For example, line 4-7 states “-determining pixels to be filtered from among pixels which were not detected as edges in the previous step, -replacing at least a pixel to be filtered with a pixel belonging to a close neighborhood of said pixel, said close neighborhood comprising said pixel and pixels adjacent to said pixel.” It is unclear what encompasses a pixel to be filtered and the close neighborhood of said pixel. Appropriate correction is required.

4. Claim 2 is objected to because of the following informalities: line 3 states “the set comprising at least *once* said pixel and pixels adjacent ...” (emphasis added). It is believed that applicant intended this to read “the set comprising at least *one of* said pixel and pixels adjacent...” Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3, 4, and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (GB 2,321,816, cited on applicant's IDS paper no. 8), hereafter Lee.

7. Regarding claims 1, 8, and 9, as best interpreted by the examiner, Lee discloses a method of processing data which represent a sequence of pictures, previously encoded and decoded (page 6, line 29-page 7, line 23; page 15, line 6-13), comprising at least in series the steps of: detecting edge pixels within a picture (page 9, line 23-33), determining pixels to be filtered from among pixels which were not detected as edges in the previous step (page 14, line 19-26), replacing at least a pixel to be filtered (center pixel) with a pixel belonging to a close neighborhood (filter window) of said pixel, said close neighborhood comprising said pixel and pixels adjacent to said pixel (page 11, line 8-15).

8. Regarding claim 3, Lee inherently discloses that the method is applied to the luminance component of the pixels of said picture (page 8, line 14-34).

9. Regarding claim 4, Lee discloses that a pixel is detected as an edge if a magnitude representative of a gradient of the pixel is greater than a predetermined threshold (page 9, line 23-33).

10. Regarding claim 7, Lee discloses that a pixel is filtered if the number of edge pixels in a defined neighborhood of the pixel lies within a defined range (page 14, line 12-33).

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***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 1 above, and further in view of Acharya et al. (USPN 6,229,578, newly cited), hereafter Acharya.

13. Regarding claim 2, Lee discloses that at least the pixel to be filtered is replaced with a value calculated using a weighted filter using a set of pixels having an odd number of pixels (3 by 3 = 9 pixels) which were not detected as edges (filter weight set to zero if arbitrary edge points), the set comprising at least once said pixel and pixels adjacent to said pixel (figures 3 and 4; page 12, line 4-17), but does not disclose that said pixel to be filtered is replaced with the median pixel of said pixel set. Acharya discloses an edge-detection based noise removal algorithm wherein a multi-level median hybrid filtering may be applied to a non-edge pixel (figure 5; column 9, line 66-column 10, line 35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace said pixel to be filtered with the median pixel of said pixel set as taught by Acharya in order to remove noise without blurring the edges (column 5, line 33-44) as well as closely preserve the original non-edge pixel because the median at each stage or level of the filtering process re-introduces the original pixel as one input at each of the median filters (column 11, line 18-22).

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14. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 4 above, and further in view of Gupta et al. (USPN 5,852,475, newly cited), hereafter Gupta.

15. Regarding claims 5 and 6, Lee discloses that a pixel is detected as an edge pixel if either the horizontal or vertical component of a gradient of said pixel is greater than a threshold (Tbh or Tbv; page 13, line 1-19), but does not explicitly disclose the claimed method. Gupta discloses a transform artifact reduction process wherein a plurality of different Sobel-based operators are used to determine edge directions within a three-by-three windows surrounding a pixel of interest (column 16, line 19-53). Gupta further discloses combining the plurality of spatial gradients to obtain the center pixel gradient by weighting different pixels within the window (column 16, line 54-column 17, line 42). Gupta does not explicitly state that the modulus of said gradient is compared with the modulus of the gradient of the adjacent pixels, but it is inherent that if a pixel is detected as an edge that the pixels on either side of that edge will have a gradient magnitude less than that of the pixel lying on the edge. It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect horizontal and vertical edges as taught by Gupta in order to generate a pixel texture estimator for each of the possible edges in a three-by-three window using weighting based on Sobel operators which has been widely tested and reported as providing good performance (column 17, line 9-24).

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPN 5,473,384 to Jayant et al. discloses a method and system for enhancing distorted graphical information wherein different median filters are used based on whether or not

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an edge is detected. USPN 6,438,270 to Harrington discloses methods and systems for image sharpening including comparing and replacing the pixel value with the median of the original pixel and two values obtained from one or more neighboring pixels. USPN 5,379,074 to Hwang discloses a multilevel nonlinear filter for edge detection and noise suppression including median filtering and average filtering. "Blocking effect reduction of JPEG images by signal adaptive filtering" to Lee et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan J Hesseltine whose telephone number is 703-306-4069. The examiner can normally be reached on Monday - Friday, 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

rjh  
August 11, 2003

JINGGEWU  
PRIMARY EXAMINER

